APPLICATION OF VIRTUAL AND AUGMENTED REALITY IN TRAINING OF SOCIAL WORK SPECIALISTS

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Abstract

The training of social work professionals is part of the lifelong learning practice. In the future, the learners participate in individual and group training sessions in virtual reality. Application of interactive methods the learners gradually adapt, analyse and apply communicative behavioural approaches to their clients without fear of mistakes. The application of a virtual environment with partial or full contact of the participant will create a perspective for the spectrum of emotions, experiences and experiences in the social work with vulnerable groups. The development of similar virtual games and simulations would be cost-effective, as it will minimize the so-called "professional" errors and inefficient behavioural decisions by social workers. Students will face different behavioural and communicative models, preparing their perceptions to respond adequately by taking part in the decision-making process of the client or the user. In learning conditions, learners in social work can analyse and develop their empathy, emotions and behaviour to improve their understanding of the process of social work with vulnerable groups. The study covers an assessment of the need and types of possible applications of a virtual environment for the training of social work professionals. An analytical approach to the problem has been applied through data from interviews and focus groups of students in the speciality "social work" and new specialists in social work are used.

Key words: *Social work, education, virtual reality, empathy development*

Actuality of the problem

In the last decade, virtual reality (VR) and augmented reality (AR) technology have been implemented in seven areas of life: games and entertainment, film experiences, travel, working environment, product manufacturing and marketing, education (training), quality of life. The technologies allow human society to solve a number of serious environmental issues – protection of air, soil and water, energy and food production. But, according to the author of the article, technology cannot solve typical personal and social problems. This is what people have to do in the future.

There are a huge number of activities that only human can do, for example, all activities related to the care of others - health, well-being, lifestyle, therapy, understanding, negotiation, socialization, integration. According to the author of the article, many of the people's professions for people are currently overlooked because of the overriding interest and encouragement of technological orientation for the professional realization of young people. At the same time, there are professions that the public considers to be inexpensive because they receive lower pay than the technology sector. Professions that build a future - work in the name of children, vulnerable people, help the person in their development, and others are difficult to practice. Students who study social work are not always aware of what stages they have to go through in order to prepare thoroughly for their professional realization. On the other hand, the universities are engaged in the technological boom and, especially in Bulgaria, but also in other European countries, is undermining and even penalizing the development of social sciences. Part of social science practice is social work and social entrepreneurship. The subject of the present study is the training of students on social work through a system of the impact of virtual and augmented realities. The main objective is to present a model of learning through a curriculum that is applicable to the practical preparation of future professionals to work in a high-risk environment with vulnerable children and adults. The author believes that social work together with social entrepreneurship, social assistance and consultation are professions of the future due to the following facts: the growing number of the population on the planet, the deepening crisis with access to drinking water and clean food (severe poverty) the field of

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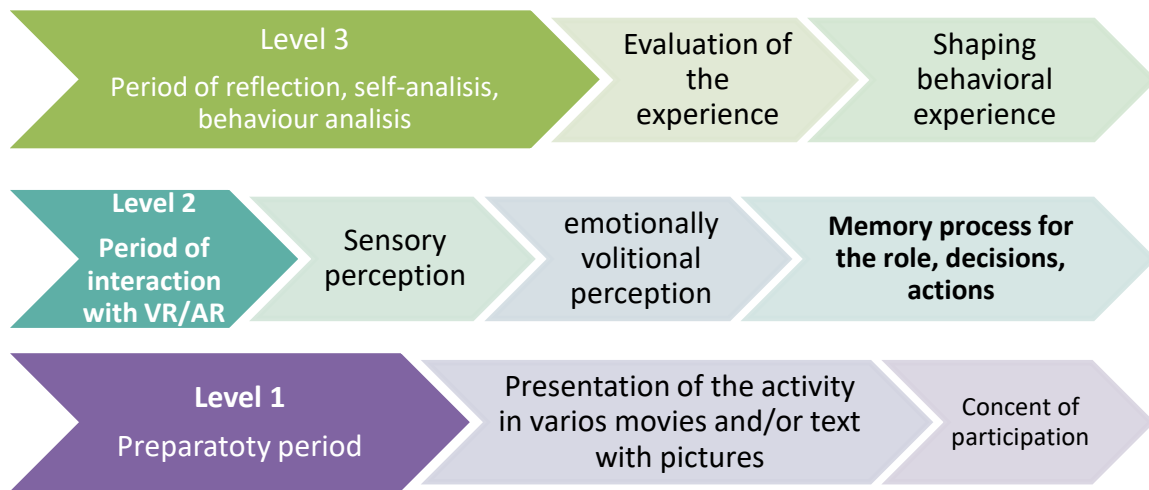dependencies, systematically unbalanced community environment through transfer of global criminality, etc.

The application of information technology in the training of social work professionals is widespread. Information platforms and media supporting communications at a distance are very widely used. Technological coverage of communication involves creating content for social networks, blogs, deposits, chats and forums. Blogs created for professional social interaction are interactive logs. In them, the communicator provides information on professional and personal experiences and cases, seeking answers by including other specialists in the discussion. The qualities of professional blogs are reviewed by Mc Donough D. J. (2011). Fischer, I. (2018) found that the professional blogs can be used as hobby blog as well and the participants in the education are more satisfied if they can talk in discussions, Köln, T. H. (2018) uses content analysis of 50 blogs, randomly selected in 2009. Some characteristics of the bloggers are discussed and some of the conclusions show a straightforward link between the clarity of the content and the behaviour of the search for the blog.

The interactive virtual internet diary allows content creators to plunge into events that have already passed in order to evaluate their actions, motives and consequences. The content creator can rearrange the chronology, images, texts, and hyperlinks (links) to additional content or links to other similar content. The virtual diaries are explored in detail by Cavazza, M., Charles, F., & Mead, SJ (2001; 2002). The scientific team makes a conclusion that many different factors contribute to the non-predictability of the unfolding plot. In particular, while the user should be aware of the potential targets for interaction, the exact consequences of his intervention cannot be predicted. A variation of socially oriented blogs is the educational blog where all kinds of content for learning and training can be added. Educational blogs with interactive content and virtual reality are studied by Eschenbrenner, B., Nah, F.F.H., Siau, K. (2008), Alverson, D. C., et al.. (2004).

The application of VR and AR in social work, entrepreneurship, assistance and consultation is in the beginning. The VR and AR provide opportunities for developing interactive, communicative and emotional learning experiences. Virtual worlds are personally adaptable as they allow participants to communicate with others through their avatars. Through objects in the environment, participants can create experiences that are not necessarily possible in the real world. On the other hand, the experience during the participation remains in the participant's memories. In order to assess the impact that these virtual worlds have on skills training, a learning model based on experiencing and gaining realistic opulence from addressing socially difficult situations is offered. Based on this model, the capabilities of the virtual world are presented, providing an experience that students can not actually get. The factors determining the application in the training are personal, emotional and organizational. Contemporary European social policy takes into account the need to achieve the pedagogical goals - social workers must be on a much larger scale ready to start work equally with their experienced colleagues. It then examines the practical and research implications - whether the virtual environment could replace genuine experience, communication and behavioural decision. The virtual worlds prove they provide unique learning experiences that are yet to be developed and studied.

It is extremely difficult to develop a sustainable model of interaction between the user and the virtual environment. It is even more difficult to develop such a model for augmented realities. The difficulty comes from the fact that the user is strictly individual - the type of superior nervous activity, the level of integration of the perception, the fullness of the common culture and the image of the world. The most difficult fact to overcome is that the human person at all times finds himself in the process of learning and experience, i.e. learning and enriching the emotional world is a process, not a constant. The pattern of interaction can be expressed by the scheme below.

Figure 1 Acquiring new professional behavioral experience for social workers through the application of virtual reality[*]

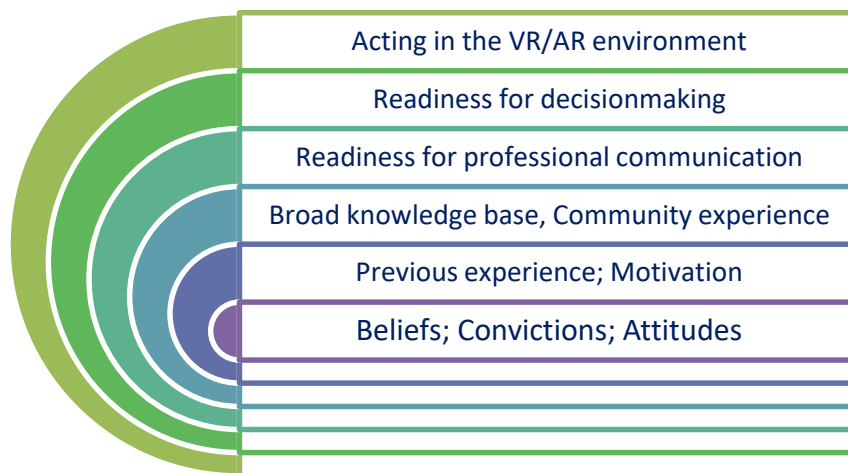| Level 3 — Period of reflection, self-analisis, behaviour analisis	Evaluation of the experience	Shaping behavioral experience
Level 2 — Period of interaction with VR/AR	Sensory perception	emotionally volitional perception	**Memory process for the role, decisions, actions**
Level 1 — Preparatoty period	Presentation of the activity in varios movies and/or text with pictures	Concent of participation

[*] Time management of the session. The duration of the periods is shown as the ratio of the individual elements of the figure

Reflection of the experience in the virtual environment of the game worlds often remains in the background. On the surface come the emotional experience and the decisions made for the sub-performance, prizes, and so on. The virtual learning experience should follow a pattern of training that generally contains three periods: preparatory, interactive, and analytical. Two of the periods - first and third - are long - they can last days, weeks. Good preparation greatly supports the full-fledged virtual learning experience. In the period of self-analysis and behavioural analysis, other types of interactive technologies can also be included - virtual diary, professional video blog, self-recording by video capture, etc.

In order to develop the three-tier system for the development of professional experience through the use of a VR/AR environment, we initially apply the cone of Edgar Dale depicting the steps in the acquisition of experience. Kovalchick, A., Dawson, K. (2004) conclusions that far more than 90% of the action is memorized by the coding of knowledge and emotion, and 50% of what has been seen and heard remains for a long time in the mind. The virtual world for the social worker's training experience in the development will be loaded with a problematic environment and images – poverty, vulnerability, and violence. On this basis, it can be assumed that the emotional training of the future social worker will be sustainable in his memory. Skill training and decision-making in a controlled environment will help future professionals form an adequate experience.

In order to develop an adequate virtual environment to perform training activity and training functions, we assume that the content must have personal modifiable elements as Cavazza at. al. performed gamification in test conditions twice – in 2001 and 2020 (Cavazza, M., Charles, F., & Mead, SJ (2001; 2002). When the trainee is already part of the real environment, he/she must be able to mode the degree of difficulty of the individual tasks. For this reason, we have to investigate which experiences are most satisfying and which are the most difficult to tackle for the trainee. Handling virtual tasks depends on past experience and student participation in the preparatory period. It can contain both static content from electronic text resources, as well as audio and video files with the presentation of solved tasks. This part of the preparation can be complemented by a self-explanatory presentation by the participant himself. The student gets acquainted with and solves a series of well-structured cases in which he/she has to quantify the situation and make decisions. A training program could be structured in the following individual development during the stages in university education.

Figure 2 Individual preparedness to acquire professional experience through VR/AR

The personal characteristics of the future social worker affect many of the decisions taken in professional life. The selection of students for training in helping professions and especially in social work needs to be improved. On this basis, we assume that the success of the prospective professional depends on his/her attitudes to the problems of society even before he enrols to study social work. The success of the future social worker depends on his / her sensitivity to individual and community social problems. It also depends on his attitude to debatable topics in the society, where one day he will be a professional.

Method of analysis

One of the methods of the research is content analysis in which have been included texts and data from significant researches and analysis in period 2010-2019 (in the references). The second method is the functional-value analysis with the following aim and tasks. The two research objects - social work education and virtual reality, are seen as a complex of interrelated functions. The research gives examples of an optimal solution for performing functions at the lowest possible cost (efficacy). The opposite position has been found by a view that human-human communication formulates better decisions, although there are possible mistakes. The research task has been to indicate and analyze examples and causes in a real situation where the social worker needs to be previously prepared for action.

Results and discussion

A) Most emotionally burdened real situations for social workers

Students in the speciality "Social management" in Technical University- Varna, Bulgaria (n=122) and social workers (n=52), whose work experience is less than 5 years in "Social Help" municipality districts in Bulgaria, are interviewed during educational seminars in the period 2017-2019. Social workers work in offices "Child Protection" and social services in the community. Interviewees are asked to share their views on which cases they think are emotionally burdened. Then they must point out cases that are very difficult to be solved. The results are given in Table 1. The interview was conducted step by step and individually to identify the experience and motivation of interviewees to study or work social work. Questions are open type. The interview card contains two parts - personal data (years and status – student or worker) and a free description of the most traumatic case, according to the interviewee.

Table 1 The most emotionally burdened cases in social work

Students' answers (up of 50% of all described cases, n=122)	Social workers' answers (up of 50% of all described cases, n=52)
Cases including children	
Victim of physical (sexual) violence	*Victim of any violence*
Addicted to drugs	*Profound disability and neglecting*
Deep poverty environment	*Ricing up in social institution without family*
Profound disability	*Addictions, hunger, helplessness*
Cases including adult citizens	
Victim of physical violence	*Profound mental or/and physical disability/illness*
Homeless in situation of helplessness	*Drugs and prostitution*
Profound drug addicted	*Victim of physical violence*
Prostitution; Promiscuity	*Parent with profound psychical illness*
Profound mental or/and physical disability/illness	*Homeless in situation of helplessness*

Table 2 The most dangerous situations in social work on terrain

Students' answers (up of 50% of all described cases, n=122)	Social workers' answers (up of 50% of all mentioned cases, n=52)
At client's home (place of living)	
Weapon prepared for use	*Strongly aggressive client or cohabitant of the client*
Unclear exit	*Lack of lighting and very noisy place*
Strongly aggressive client or cohabitant of the client	*Availability of weapons at the client's home*
Drugs prepared for use	*Many people gathered in a little space*
In the in the neighborhood	
Crowd in the neighborhood	*Odd, unacceptable behavior around the client's home*
Unclear exit from the neighborhood	*A crowd, too noisy music, crowded people around the client's home*
Aggressive family or cohabitant	*Aggression manifestations*
Too noisy and crowded neighborhood	*Undisclosed place without clear entry-exit*
Need for translation when meeting with neighbors	*Neighbors carrying weapons*

All described recurrences in Table 1 and Table 2 are the result of real-life situations as it is. The social worker's meeting with the client is necessary to prepare a document for assessing the risk of a child or adult abuse. On the other hand, in Bulgaria and in other countries, social workers visit the client's home to assess the individual needs of support and protection. Social work with young people with mental illnesses, mental disabilities, and behaviour in conflict with the law is described as risky to deal with inexperienced professionals (Милушева, Т. 2017). Goodwill towards the client and the experience of the social worker support the interaction. The main priorities are emotional support, encouragement and positive feedback on the positive change in the life of the client. At the support stage, the social worker supports the resocialization, social functioning and new social skills of the individual. The main priority is the prevention of relapses.

A) According to the Bulgarian normative documents in the social work, visits to the client's home should be carried out by two specialists. These may be two social workers, but also a social worker and a psychologist or a social worker and a nurse or a lawyer. In critical situations, the social worker's experience of working in a team and at a risk is of paramount importance (Ambrose-Miller, W., Ashcroft, R., 2016). The work of the team or the working

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pair must be completed before the cooperative activity begins in the conditions of risk. The proportion of social workers who visited clients at home or saw them in institutional settings was up from 2014 to 2016, at 55% (from 50%) and 42% (from 37%) respectively by the report of Community Care, UNISON (2017). The social worker needs behavioural coping methods in the risk situations in the client's neighbourhood and at the working place. Stalker, K. (2003) argues that the teaching plan of social work has to include coping strategies with risk situations connected with client habitus (Stalker, K., 2003). On the basis of these results from the research and analysis of relevant sources, scenarios can be proposed on the basis of which to develop BP and AP programs. Technology VR and AR have a wide potential for social work education. It can enhance access, skill development, student engagement, and learning outcomes for all levels of education including formal education, field instruction, continuing education, supervision, and organization-based education. Knight, S. introduced some key elements in the development of manuals on the use of technology in training social workers (Knight, S., 2017)

B) Difficulties in training social work specialists

In a series of research, the author of the article sets out his point of view on the difficulties in training and realization of students in the field of social work. In the period 2013-2018, the following problem areas were identified in student education. Personal readiness and motivation before training is a problem sometimes. The student enrols to study social work without sustainable internal motivation and readiness for that particular subject. A more frequent problem in learning is "re-enrollment" of the student, i.e. she/he wants to enter the practical environment of social work very quickly without being sufficiently theoretically and behaviourally ready. A very common problem is passivity with regard to foreign problems. This type of behaviour is based on the idea that the problems of society are not personal problems, so dealing with the problem is the very person in trouble. A very common problem in regular training students is a limited life experience.

It is a common practice in university education for social workers to participate in apprenticeships and learning practices. Different programs model training and supervision on different models. The authors of the practical skills curricula are unanimous that the coping strategies are passed from a mentor to a learner. Of great importance are the professional qualities of the mentor and the conditions arising from his work environment. Механджийска, Г. et al. argue that the main goal of the program is to acquire basic practical skills on how to implement support activities, interact with clients and serve them in social work institutions by creating a field of study for students. Students are required to familiarize themselves with the status, the legal basis, the basic functions of the basic organization and the management relationships in it. Rybakova, A. I., Fomina, S. N. (2015) said that the student should form skills for applying the normative base and for keeping the internal organization documentation in the direct work with clients. The introduction of the methodology and the procedure of performing social services and assisting activities in general in a specific institution for social work are obligatory. Students should master the basic steps, actions, skills from the methodology of social work on a case by case basis as a basic assistive method and according to the specificities in a specific institution for social work. A hard and continuous task is the development of practical skills for using methods and techniques for interaction with clients, interviewing, conducting sessions, carrying out support interventions. On this basis, the student should learn to identify and understand the specifics of the cl stakeholders from different target groups and the ensuing social work requirements through monitoring and active communication with them in practical situations. M. Doel and S. M. Shardlow (2017) describe the difficulties in the process of training students in social work as follow: inside and outside stressful environment, low capacity of behaviour, confidence. More specifically the difficulties can be described as follow: low level of working conditions in a stressful environment, difficulties in communication in the context of a dispute, low level of positioning activity, uncertainty, and others.

Nikitina, N. I. et al. share summary report of a multi-annual survey in which the team set a few types of continuous training for social workers. The types of the most popular clustered personalized professional educational services in the graduate education of specialists social work and other "helping professions": Adaptive-remedial courses (necessary to change some personal, behavioural, communication and other manifestations of a specialist to improve the professional, social and cultural adaptation of personality, such as the continued relevance of the courses "Conflict competence expert in social work", "Professional-communicative culture expert of social sphere", and "Confessional tolerance specialist socio-economical profile".

Some authors offer after completing their training, and when starting work in the speciality, social workers are involved in courses to improve the skills and teachings of working with extremely vulnerable clients and groups(Wagaman, M. et al.., 2015; Terziev, V. et al.., 2017; Teding van Berkhout, E., Malouff, J. M., 2016). This raises the question: is it possible, on the basis of the developed virtual worlds, on the topics set out in Tables 1 and 2, that social work students acquire in advance a certain well-defined idea of their functions and behaviour. How such experiences would affect the emotional stereotype, readiness and motivation of students to practice social work.

C) Assess the impact of realistic pictures on people with high sensitivity

According to Martín-Gutiérrez, J. at al. social technology needs to be user-friendly and cost-effective recombinant technology that is used to solve social problems in the fields of health, welfare, medical, education, hygiene, environment, safety, and developing countries. VR/AR, virtual blogs, diaries, forum and etc. are socially-useful technology or social interest technology. They are also society driven innovation and appropriate technology. In addition, social technology transforms existing technologies into new ones by reconfiguring and redesigning them and connecting them to service delivery systems (Chang Hee Jung, 2005; Song, 2011). According to the Korean intellectual property organization KIPO, 277 cases of patents related to medical technology have been applied to augmented reality (AR) and virtual reality (VR) for 20 years from 1998 to last year and the average annual growth rate of patent applications has increased rapidly to 49.4% over the last 6 years (2012-2017). In some countries, there is an overwhelming interest in developing technology for learning, including social work and psychotherapy with patients with schizophrenia (Chang Hee Jung, 2005; Jang, Sun – Ho, 2008; Park, Ji – Youn at al 2010, Bae Young-kwon at al., 2018).

Perception is a cognitive psychic process in which individual objects and phenomena reflect the objective reality in their entirety and their immediate impact on the sensory organs. Integration of individual sensory data determines the overall image of the subject. The process of revealing the meaning of the subject is called categorization. Marchewka, A. at al (2014) describes categorization presupposes a precise differentiation of the degree of expression of the set of properties inherent in the perceived object. Categorization becomes an internal impulse to continue and deepen the perceptual process with vague sensory data (Marchewka, A., Żurawski, Ł., Jednoróg, K., & Grabowska, A. (2014).

Mantiuk, R. At al (2005) argue that the use of realistic pictures in children's education improves the development of sensory integration. Sensory integration is a process of arranging and processing sensory stimuli in which the brain produces an adequate and purposeful response from the body, as well as sensible perceptions, emotional responses and thoughts. Sensory integration is the process of turning perception into perception. It sorts, arranges and unites all sensory feelings of the individual in a full brain reaction. The normal development of the sensory system of a person needs the constant introduction of sensory stimuli (Mantiuk, R., Daly, S. J., Myszkowski, K., & Seidel, H. P., 2005).

Irritations are the factor that causes the formation of new and new neuronal synapses and the construction of a broad and complex network between nerve fibres. The more impulses (emotions) pass through a synapse, the easier the nerve impulse is going to happen each time, and this is practically a learning process. Wang, Q. L. (2019) describes the sensory perceptions

and their integration help to develop the individual components of the nervous system in organizing motor, language and thought operations and emotional responses, which increases the child's self-esteem and social functioning. Some disorders of sensory integration can also be found in adults (including university students). For example, incorrect reading or reporting of sensory signals having a direct relation to the decoding of the information; hypersensitivity of certain sensory channels; lack of sensitivity in sensory channels and others (Wang, Q., Li, C., Xie, Z., Bu, Z., Shi, L., Wang, C., & Jiang, F., 2019).

D) The specific of communication and behavior in the virtual reality

Virtual reality is an alternative to face-to-face interaction, as its main purpose in learning is to develop verbal communication and behaviour. The presence of a visually fixed body in the virtual environment helps learners feel realistically interact with another person in the virtual world. However, according to the Bae Young-kwon at al. (2018), the study does not show a significant difference in the social presence between the trainee and his incarnation in the virtual environment. His input is with lower social awareness, probably reflecting the lack of information about the virtual image. The interest of the learners declines rapidly when they alone in the virtual environment.

According to Smith, H. J., & Neff, M. (2018), there are also some basic problems - the possibility of individualizing situations should be at a high level. If in the virtual world the learner has to learn how to create clear, objective impressions from an environment, he should have options to check if his conclusions are correct. The movements he will make in the virtual environment should give him options for behavioural decisions. The second serious problem in designing a virtual learning environment for social workers is that we measure communication by applying a subjective approach (Kang Hyung Chul, 2017). Therefore, in the third stage of student training (see Figure 1), self-analysis and self-analysis should be very serious. This would be a process, not a single assessment act. The trainee should develop his or her own approach of analysis to his / her own thoughts, speech and actions.

The third major problem lies in the technology of animation and animation realism. Still, the human face is inimitable on the computer. Therefore, for the purpose of learning, it is better to use realistic pictures, not animations. The development of empathy and adequate reactivity in social work is a complex process. Numerous emotional and personal changes are undergoing students studying this profession. Not all students are able to build an adequate path for personal self-analysis. For this reason, virtual reality learning should be combined with a personal virtual blog or a virtual diary.

Conclusions

1. The training of social workers requires, to a great extent, self-reflection and development of personal qualities. Gaining experience before entering the workplace would be a significant asset for quality work with vulnerable children and adults.

2. The introduction of VR / AR training as a pre-training adds deeply personal experience to the trainee. The memory of trainees remembers feelings, thoughts, movements, emotional response to the environment, and all this guarantees the long-lasting preservation of memories, thus forming a profound experience.

3. Topics on which to develop virtual worlds are those related to the vulnerability of children and adults, and among them, the most important is the reaction to child or adult violence, aggressive mood by the client, helplessness of the client, including severe physical, mental injury or disease.

4. Virtual worlds for the purpose of training social workers should include a variation in the difficulty level of the tasks assigned and should provide for the possibility of personalization depending on the learner's preferences.

References

Механджийска, Г., Р. Симеонова, В. Боянова,Т. Милушева (2017). Модел на теренна практика в обучението по социална работа, Е-списание Социална работа 2017,бр.1, год. V,18–44

Милушева, Т. (2017). Социална работа с младежи с поведенчески отклонения: съпротиви за промяна и мотивация. *Management & Education/Upravlenie i Obrazovanie*, vol.XIII(4), 36-46

Alverson, D. C., Saiki, J. S., Jacobs, J., Saland, L., Keep, M. F., Norenberg, J., ... & Wax, D. (2004). Distributed interactive virtual environments for collaborative experiential learning and training independent of distance over Internet2. *Studies in health technology and informatics*, *98*, 7-12.

Ambrose-Miller, W., & Ashcroft, R. (2016). Challenges faced by social workers as members of interprofessional collaborative health care teams. *Health & social work*, *41*(2), 101-109.*13*.

Bae Young-kwon, Park Wan-woo, Moon Kyung-sik, In-hwan Yu, Woo-yul Kim, Lee Hyo-nyeon, Shin Seung-ki (2018) Development and satisfaction of the convergence talent program using Virtual Reality (VR) equipment and learner attitude analysis/ Training design of STEAM programs using virtual reality equipment and analysis of its effectiveness and student attitude, Journal of The Korea Information Processing Society, 10/2018, p.p.593-603 https://www.earticle.net/Article/A339767

Cavazza, M., Charles, F., & Mead, S. J. (2001). Characters in Search of an author: AI-based Virtual Storytelling. In *International Conference on Virtual Storytelling* (pp. 145-154). Springer, Berlin, Heidelberg.

Cavazza, M., Charles, F., & Mead, S. J. (2002). Interacting with virtual characters in interactive storytelling. In *Proceedings of the first international joint conference on Autonomous agents and multiagent systems: part 1* (pp. 318-325). ACM.

Chang Hee Jung. (2005). A Study on the Application of Social Skill Training Program Using Virtual Reality Technique. Ewha Womans University graduate school, DSpace https://dspace.ewha.ac.kr/handle/2015.oak/178990

Community Care, UNISON (2017) A day in the life of social work, [https://www.unison.org.uk/content/uploads/2017/03/CC-SocialWorkWatch_report_web.pdf] – 24.05.2019

Doel, M., S. M. Shardlow (2017). Modern social work practice: Teaching and learning in practice settings. Part II Direct practice: inter-professional learning and practice: Working in difficult situations , Routledge.p.p.23-33

Eschenbrenner, B., Nah, F. F. H., & Siau, K. (2008). 3-D virtual worlds in education: Applications, benefits, issues, and opportunities. *Journal of Database Management (JDM)*, *19*(4), 91-110.

Grebennikova, V. M. (2015). Qualimetric methods in the evaluation of the quality of professional training of specialists in social work. *Review of European Studies*, *7*(3), 66.

Fischer, I. (2018, May). Exploring Readers' Perception of Professional Blogs. In *International Conference on Digital Economy* (pp. 16-27). Springer, Cham.

Jang, Sun - Ho. (2008). u Intelligent social service based IT / BT / NT convergence technology. *Journal of Information Science* , *26* (1), 24-30

Kang Hyung Chul. (2017). A Study on the Possibility of Utilizing Meditation Education in Virtual Reality (VR) and Augmented Reality (AR). *Studies in Religious Education* , *54* , 97-116.

Kovalchick, A., Dawson, K. (2004). *Education and Technology: An Encyclopedia. ABC-CLIO. p. 161,*Retrieved 21 January 2017

Köln, T. H. (2018, July). Exploring Readers' Perception of Professional Blogs. In *Digital Economy. Emerging Technologies and Business Innovation: Third International Conference, ICDEc 2018, Brest, France, May 3-5, 2018, Proceedings* (Vol. 325, p. 16). Springer.

Knight, S. (2017). New technology standards guide social work practice and education, social work today, vol.17, N4, p.10

Mantiuk, R., Daly, S. J., Myszkowski, K., & Seidel, H. P. (2005). Predicting visible differences in high dynamic range images: model and its calibration. In *Human Vision and Electronic Imaging X* (Vol. 5666, pp. 204-215). International Society for Optics and Photonics

Marchewka, A., Żurawski, Ł., Jednoróg, K., & Grabowska, A. (2014). The Nencki Affective Picture System (NAPS): Introduction to a novel, standardized, wide-range, high-quality, realistic picture database. *Behavior research methods*, *46*(2), 596-610.

Martín-Gutiérrez, J., Mora, C. E., Añorbe-Díaz, B., González-Marrero, A. (2017). Virtual Technologies Trends in Education. Eurasia Journal of Mathematics, Science and Technology Education, 13(2), 469-486.

McDonough D. J. (2011). A window into the profession: What translation blogs have to offer translation studies. *The Translator*, *17*(1), 77-104.

Trotto, L. A., Trotto, M. T., Ruginis, R. A., & Jeffway Jr, R. W. (2014). *U.S. Patent No. 8,819,533*. Washington, DC: U.S. Patent and Trademark Office.

Nikitina, N. I., Romanova, E. Y., Komarova, E. V., Tolstikova, S. N., & Grebennikova, V.M. (2015) Personalized Approach to Professional Development of "Helping" Professions Specialists. Mediterranean Journal of Social Sciences, vol. 6 N 5 S4 October 2015 MCSER Publishing

Park, Ji - Youn, Koo, Jung - Hoon, Sang - Woo Cho, Jung Young - Cheol, & Jae Jin Kim. (2010). A Study on the Applicability of Coping Skills Training Using Virtual Reality Technique. *Mental health and social work* , *34* , 56-90.

Rybakova, A. I., & Fomina, S. N. (2015). The model of professional training of specialists of social work in the conditions of multilevel education on the basis of integrative approach. Contemporary Problems of Social Work, 1(3), 55-61.

Smith, H. J., & Neff, M. (2018). Communication behavior in embodied Virtual Reality. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (p. 289). ACM.

Stalker, K. (2003). Managing risk and uncertainty in Social work, Journal of social work 3(2), p.p.211-233

Wagaman, M. A., Geiger, J. M., Shockley, C., Segal, E. A. (2015). The role of empathy in burnout, compassion satisfaction, and secondary traumatic stress among social workers. *Social work*, *60*(3), 201-209.

Wang, Q., Li, C., Xie, Z., Bu, Z., Shi, L., Wang, C., & Jiang, F. (2019). The Development and Application of Virtual Reality Animation Simulation Technology: Take Gastroscopy Simulation System as an Example. *Pathology & Oncology Research*, 1-5.